

Chapter 8: Utilities

Introduction

The City of Elk River's infrastructure systems are the framework for the City's basic operations and future growth. These systems operate and provide basic support for the lives of Elk River's residents. Ultimately, a key principle of this Chapter is to provide infrastructure investments that correspond to the community's growth potential. As Elk River develops, the development should be managed to make the most efficient use of existing and future investments in infrastructure and public facilities.

The Comprehensive Plan sets the pattern for future development within the City of Elk River, which ultimately defines the parameters for municipal utilities needed to support this new development. Alternatively, the limitations of the utility system influence the type, form and location of future development.

As demonstrated in the City's 2004 Comprehensive Plan, the utility system represents significant public investment, and as such continued coordination between community development and utilities is essential to make the best use of financial resources. The City must determine the appropriate timing for any public financing of new service extensions and improvement, considering the land use policies set in place and community development goals of the Plan. Encourage development and growth in areas contiguous to existing development and areas currently served by infrastructure will maximize the efficiency of City services.

The City of Elk River has a land area of approximately 28,000 acres within the city limits. The City has delineated this area into rural areas (no municipal water and/or sewer services provided) or urban service areas (municipal water and/or sewer services provided). The City provides water and sewer services to residents within the urban service area as shown in **Figure 8.1: Urban Service Area**. It is the City's belief that over the next 20 years the urban service area will be fully developed and that additional land areas will be added as shown in **Figure 8.2: Future Development Within the Urban Service Area** and **Figure 8.3: Future Development Outside the Urban Service Area**.

Although many of Elk River's growth areas, as designated in Chapter 5, presently include adequate infrastructure, other growth areas will require extension and improvements. As these areas develop/redevelop, the City should invest in new infrastructure with care; consideration must be given to the total public and private costs of new services. Public dollars must be spent wisely in providing these services. The boundary should only be expanded if the City believes that sufficient sewer and water treatment capacity will be available to serve property within the urban service area and the development (and redevelopment) within the expansion area. The implications on treatment capacity should also be considered with redevelopment projects and changes in land use that will alter demands on the utility system.

The Elk River Municipal Utilities provides electric and water services to Elk River and surrounding areas and is responsible for the construction, operation and maintenance of these systems. The Utilities Commission serves as the governing body for the Municipal Utilities. Wastewater treatment and storm water management are the responsibility of the City Council and City staff.

The goal of this Chapter is not to present a “plan” for the expansion and operation of the municipal utility system, rather to provide citizens, designers, City staff and potential developers with the knowledge to make more informed choices.

Inventory and Analysis

Sanitary Sewer

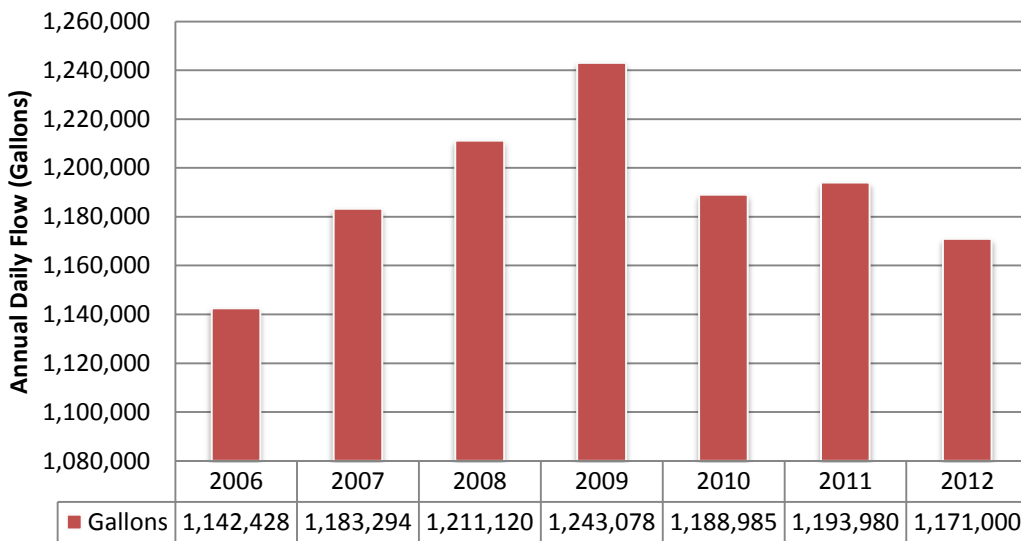
Elk River’s desired future land use pattern must be tied closely with a cost-effective wastewater service strategy. The City must be certain in determining the pattern of sanitary sewer interceptors, lift stations, and force mains to complete its development pattern. Moreover, the City must ensure that costs of these improvements are equitably distributed and services are provided in a planned, phased sequence that promotes development.

The sanitary sewer collection system in the City of Elk River includes over 77 miles of lines. As a result, 21 lift stations are needed to transport sewage to a wastewater treatment facility that the City of Elk River owns and operates that serves the residents of Elk River as well as commercial and industrial users located within the community. The plant is located between Highway 169 and the rail line, north of the Great River Energy plant and has been in operation since 1977 with several upgrades since. Wastewater improvements since 2004 include upgrades to the wastewater treatment facility in 2005, sand filter upgrades in 2006, and upgrades to various lift stations every year.

In February 2013 a Wastewater Treatment Facility Plan was completed to evaluate the capacity of the existing facility and the ability to reliably achieve the reduced effluent limits at design flows and loads and to develop a plan for future plant modifications. As improvements to the facility are presented, the City should follow the recommendations of the Wastewater Treatment Facility Plan.

The current plant has a maximum treatment capacity of approximately 2,200,000 gallons per day. On June 23, 2012 the highest daily flow was recorded at 1,930,000 gallons. **Table 8-A: Wastewater Treatment Facility Average Daily Flows 2006-2012** shows the changes in annual daily flow since 2006.

Table 8-A: Wastewater Treatment Facility Average Daily Flows 2006-2012



The size and location of the sanitary sewer collection system influences the ability to expand the system, which results in a limit to the growth and development of land. Areas outside of the urban service area are included in this limitation, the area currently being mined as identified in **Figure XX: Land Use** is a critical area.

Projected areas of development and flow from un-sewered connections from the Wastewater Treatment Facility Plan were used to estimate the average daily flow (ADF) at 3,980,000 gallons for the year 2035. Improvements to the wastewater treatment facility will be necessary to meet the requirements for this future planned growth to meet the design approved by the City. Improvements to the wastewater treatment facility are anticipated to occur over the next several years as outlined in the Wastewater Treatment Facility Plan and should be incorporated into the City's CIP accordingly. Wastewater flows will be monitored by the City and Treatment Facility improvements will be completed as flows increase.

Water System

A key element of this section of the Plan is to ensure that the City of Elk River provides a safe and adequate water supply. A sufficient water supply is a fundamental prerequisite for community growth and sustainability. Obtaining, protecting and distributing drinking water that meets health standards is one of the most important functions performed by a community. In addition, water pressures must be maintained for health, convenience, and to meet multiple and simultaneous demands by local residents.

It is important to also maintain adequate water pressure and supply for fire protection. The City must maintain and expand its present system to ensure reliability and meet increasing water demands and quality standards. Strategic improvements to support desirable growth patterns will be critical as well.

ERMU operates the water system for the City of Elk River and has done so since its creation on October 4, 1945 by the City Council. Water is supplied from 8 wells ranging from 225 to 406 feet in depth with water drawn from the Mr. Simon Hinckley aquifer. The wells range in capacity from 650 to 1,300 gallons

per minute (gpm). The water utility is positioned well for the long term growth with the capability of providing over 8 million gallons of water per day to local residents and businesses.

ERMU's water system contains over 78 miles of water mains and 4 water towers that have a total capacity of approximately 4,000,000 gallons of water. Peak day water pumped in 2012 was on July 16th with 4,420,000 gallons and 2012 water sales were 727,912,000 gallons.

System improvements undertaken by ERMU since 2004 include: painting three water towers, added 3 miles of main, changed over 4,000 meters to automated meter reading, completed a 20 year wellhead protection plan, and modified pressure zones in the City to optimize existing pressure by installing RPZ valves. ERMU also installed additional well filter equipment to better serve the long term growth of the City.

Water efficiency and conservation efforts have been increased as the concern for the longevity of the aquifers in the state. The water utility implemented a rebate program to promote the installation of Smart Irrigation Controllers, implemented tiered pricing structures to promote water efficiency, and provided rebates and rate schedules for customers that irrigate using the most efficient equipment available. There are also programs for smaller customers that promote rain gardens and water barrels for residential customers. These efforts support the long term growth of the City and water supply.

Electric System

The Elk River Municipal Utilities operates an electric system in the City of Elk River that provides service to approximately 44 square miles as shown in **Figure XX: Power Distribution**. The ERMU purchases power from Connexus Energy and constructs and operates the distribution system, including lines and substations, needed to provide power in its service area. There are approximately 315 miles of electric lines throughout the City, of which approximately 70% are underground. As part of the long term growth plan for the City of Elk River the utility has added an additional 65,000 kW of substation capacity to the distribution system since 2004.

Elk River Municipal Utilities (ERMU) received national recognition in 2011 when awarded a high honor for having reliable and safe electric service. There are more than 2,000 public power utilities and ERMU is one of only 176 receiving the Reliable Public Power Provider (RP₃[®]) award. The award is based off of four categories: reliability, safety, workforce development and system improvement.

ERMU's reliability index numbers reflect the condition of our robust electrical system as well as our commitment to long term growth and superb customer service. The ERMU reliability numbers are comparing extremely well to other electric utilities in Minnesota. Elk River Municipal Utilities' 2012 reliability numbers were as follow:

1. ASAI (average service availability index) is a measure of the average availability of the sub-transmission and distribution systems to serve customers. It is the ratio of the total

customer minutes that service was available to the total customer minutes available in a time period. This is normally expressed as a percentage. ERMU's 2012 ASAI is 99.999% Availability.

2. CAIDI (customer average interruption duration index) is defined as the average length of an interruption weighted by the number of customers affected. It is calculated by summing the customer minutes off during each interruption in the time period and dividing this by the number of customers experiencing one or more sustained interruptions during the time period. The resulting unit is minutes. The index enables utilities to report the average duration of a customer outage for those customers affected. ERMU's 2012 CAIDI is 66 minutes.
3. SAIDI (system average interruption duration index) is defined as the average interruption duration for customers served during a specified time period. It is determined by summing the customer minutes off for each interruption during a specified time period and dividing that sum by the average number of customers served during that period. The unit is minutes. This index enables the utility to report how many minutes' customers would have been out of service if all customers were out at one time. ERMU's 2012 SAIDI is 7.7 minutes.
4. SAIFI (system average interruption frequency index) is defined as the average number of times that a customer is interrupted during a specified time period. It is determined by dividing the total number of customers interrupted in a time period by the average number of customers served. The resulting unit is "interruptions per customer." ERMU's 2012 SAIFI is 0.117.

In 2012, the electrical peak demand was at 59,620 kW with the annual energy sales of 273,455,846 kWh. The Landfill gas generation facility contributes approximately 26 million kilowatt hours, or 9% of the City's needs.

Table 8-C: Electric Generation Units

Unit No.	Capacity (kw)	Horsepower	Date Installed	Fuel
1	550	735	1947	Diesel Fuel
2	550	735	1947	Diesel Fuel
3	3,000	4,100	1961	Diesel Fuel & Gas
4	5,000	6,911	1971	Diesel Fuel & gas
Landfill	3,200	4,600	2002 & 2006	Landfill Gas

ERMU will need to add electric substations and modify or improve some of the existing substations as development occurs.

Storm water Management

Many of the goals and smart growth principles that are discussed throughout this Plan can only be fully achieved when issues surrounding stormwater management and environmental protection are considered as central to the planning process.

The City of Elk River conducts surface water management planning to determine the needs and approaches for managing storm water systems throughout the community. Managing stormwater and surface water protects and improves the quality of our lakes, streams, and rivers. It also helps to control flooding.

The formal storm water system consists of catch basins, pipes, ditches and detention ponds. Wetlands and other natural systems play an important role in effective storm water management and further analysis of these systems is outlined in **Chapter 11: Environmental Resources**.

With a lack of Watershed Districts or Water Management Organizations within the County, the City has been utilizing the existing Stormwater Ordinance and the existing Stormwater Pollution Prevention Plan (SWPPP) for water management issues. The City is currently in the process of updating the SWPPP and developing a Surface Water Management Plan by the end of 2013. The implementation plan within the new document should be followed for purposes of future planning related to stormwater management.